



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
SOLID WASTE AND EMERGENCY
RESPONSE

From: Leslie Bell, Chris Rhyne and Nancy Hunt

To: Stephen Heare, Acting Director
Permits and State Programs Division

Subject: Report on Site Visit to Oconee Nuclear Power Plant
Duke Power Company

Facility Background

On February 12, 1998, members of the EPA mixed waste team (Nancy Hunt, Chris Rhyne, and Leslie Bell of OSW, John Michaud of OGC, and Javier Garcia of EPA R4), and Mark Harvley of the State of South Carolina conducted a site visit to Duke Power's Oconee Nuclear Power Plant to gather information concerning the generation, storage, and disposal of low level radioactive wastes, and mixed wastes. Duke Power staff included: Sheila Constance, Scientist, Environmental Management; Carrie White, Environmental Management; Tom Smith, Radiation Protection Officer; and Scott Manning, Supervisor of the Radiation Waste Group that processes liquid wastes. The site is located in Seneca, South Carolina, about a 2-hour drive from the EPA Region 4 office in Atlanta, Georgia, and can be reached via Interstate 85.

The plant is unique in the power generating industry in that it generates both hydroelectric and nuclear power. The facility borders two large man-made lakes, Keowee and Jocassee (built for this dual energy production purpose). The power plant now consists of three nuclear units and two hydroelectric units that provide supplemental electricity, as well as act as an emergency power source in the event of an unforeseen reactor failure.

The nuclear side of the Oconee Power Plant ("the facility") utilizes three pressurized water reactors (PWR). It has been generating electricity since 1973 when the first of its three units began operations. In 1997, the Oconee Power Plant generated 13.7 million megawatt hours of electricity, of which 65-70% was produced by the nuclear units. The Oconee facility has an NRC license which is scheduled to expire in 2014. Efforts are underway to obtain an extension of the license to 2034.

Mixed Waste Characterization

Oconee currently generates primarily the following types of mixed wastes: PF degreaser and paint chips. These mixed wastes are most frequently generated during scheduled outages (shutdowns for control rod replacement) which are necessary approximately every 18 months. At that time, the facility maintenance program includes fabrication, refurbishing, repainting, and other housekeeping activities. Over 1000 pounds of mixed and hazardous waste (mostly degreasing agents) may be generated.

Oconee has approximately 3000 pounds of a variety of legacy wastes: aerosol can liquids, antifreeze, batteries, carbon dioxide blast decontamination filters, circuit boards, electrosleeving waste, elemental mercury, freon filters, freon still bottoms, grease, grinding coolant, lighting waste, paint, paint solids/still bottoms, photographic wastes, and sandblast grit. The oldest of these wastes, ten pounds of elemental mercury, has been on site since 1993. Wastes are packed into 55 gallon DOT specification drums, or polyethylene bags, and stored on-site. The wastes are packaged as if ready for transportation, but no adsorbents have been added.¹

Oconee has been working with Molten Metal Technology (MMT) since 1995, and is currently in the process of profiling selected legacy waste streams to detail what chemicals and solids are in the waste stream. The facility is also looking at Envirocare to treat and dispose its paint chips and sandblast grit residues.² In the meantime, the facility is considering solidifying its sandblast grit within ninety days for disposal at Barnwell.

Disposal Costs

Disposal cost for grease has in the past been approximately \$40,000/drum for material at picocurie radiation levels. (These are levels that are found in greases sold over-the-counter, but because they have been used in the radiation control area of the power plant NRC regulations govern their disposal!) Disposal of paint chips has cost Duke Power as much as \$68,000/drum. Today, disposal costs for paint chips is approximately \$75,000 for two drums. In late 1996 and early 1997 Oconee was able to send 60 drums of PF degreaser, freon, freon still bottoms, and

¹If the waste is rad-only waste, NRC requires that it must be containerized, must have a rad label, and must be stored in area posted for radioactive materials. If there are spills, NRC requires contamination reports for the spills--either self reports or NRC staff reports might document a spill. NRC tracks these reports (especially for liquid spills). The storage room has a containment sump.

²The facility buildings were initially coated with lead/asbestos based paint because of NRC regulations. Now NRC is requiring removal of this material. The original NRC requirement was for corrosion control. The NRC requirement to remove this paint will generate additional unanticipated mixed wastes, which cannot be treated by DSSI, and may be in quantities too small for acceptance at Envirocare.

other wastes to MMT for approximately \$1.5 million. This shipment was made after an extensive treatability study of small quantities of the underlying hazardous constituents.

Storage Areas

The facility stores mixed waste in back of large tanks used for storing low level liquid wastes. Access to the building is within the facility's fenced-in radiation control area. The building itself is locked and the stairway to the mixed waste storage area is also locked. Mixed waste containers are moved by remote ceiling cranes. The ceiling was laid out in a grid so the location of each container could be specified and recorded.

Currently the facility has six interim status satellite areas--used at one time to store containers of hazardous wastes (such as used oil). These wastes have been sent for treatment and the areas are empty--and no longer used for waste storage. The facility would like to clean close these areas. However, the facility has chosen not to close out these areas under RCRA because the state wants the facility to break up the concrete flooring (some of which is epoxy coated) to be sure no leakage has occurred. The facility maintains that: 1) the treated concrete floors are impervious to spills; and 2) a radiation survey will prove that waste is not present on, in or below the concrete floor since radionuclides and hazardous constituents would likely travel together through any fractures in the concrete. To date the state has not agreed to the radiation survey approach to demonstrate clean closure. There are no documented releases or spills of hazardous waste.

Permitting

The facility also has a permit for the currently generated mixed waste. The State is requiring the facility to go through corrective action. The facility's issue is how to demonstrate clean up for a 350 acre plant site that may include bottoms of man-made lakes.

Currently there are four full-time NRC staff on-site. The facility has never had the need to implement its contingency plan, and is audited by the NRC every 18 months. The NRC reviews the facility's waste shipments and monitors them as well. The facility inspects storage areas weekly, and has remote cameras to assist with inspections. At the Catawba Plant, for example, remote monitoring is used because mixed waste storage is inside a low-level radioactive waste area which is rather hot.

The facility will have to analyze the Phase IV rule to see if the waste still meets land disposal requirements. The State of South Carolina requires the use of state certified labs for waste analysis. The facility has an on-site lab with research facilities to generate TCLP analyses.

Regulatory Relief Sought

The facility desires regulatory relief from corrective action and permitting. They do not want to go through the full-blown RCRA permitting process for the small amounts of mixed waste they generate.